Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of the claims in the application.

Claims Listing

1-27. (Canceled)

28. (New) A method for applying a continuous reactive epoxy-containing coating to a substrate, comprising subjecting the substrate to a pulsed plasma discharge in the presence of glycidyl methacrylate such that polymer growth of a continuous coating containing reactive epoxy groups occurs on a surface of the substrate, wherein the average power density of the pulsed plasma discharge is less than 0.0025 W/cm^3.

29. (New) The method of Claim 28, wherein the pulsed plasma discharge is applied in a single ON-OFF sequence.

30. (New) The method of Claim 28, wherein the pulsed plasma discharge is applied over a period of from 30 seconds to 20 minutes.

31. (New) The method of Claim 29, wherein the pulsed plasma discharge is applied over a period of from 30 seconds to 20 minutes.

32. (New) A method for functionalizing a surface of a solid substrate with a continuous polymer coating having reactive epoxy groups, comprising selecting glycidyl methacrylate as an epoxy monomer and subjecting the substrate to a pulsed plasma discharge in the presence of the selected monomer at a selected average power density less than 0.0025 W/cm^3 under reaction conditions providing for a continuous polymer coating containing

reactive surface epoxy groups therein, wherein the pulsed plasma discharge is applied over a period of from 30 seconds to 20 minutes.

33. (New) The method of Claim 32, wherein the pulsed plasma discharge is applied in a single ON-OFF sequence.

34. (New) A method for functionalizing a surface of a solid substrate with a continuous polymer coating having reactive epoxy groups, comprising subjecting the substrate to a pulsed plasma discharge in the presence of glycidyl methacrylate at a selected average power density less than 0.0025 W/cm^3, wherein the pulses are applied in a single ON-OFF sequence under reaction conditions providing for a growth of a continuous polymer coating on the surface, and wherein the continuous polymer coating includes reactive surface epoxy groups.

35. (New) The method of Claim 34, wherein the pulsed plasma discharge is applied over a period of from 2 minutes to 15 minutes.

36. (New) A method for functionalizing a surface of a solid substrate with a continuous polymer coating having reactive epoxy groups, comprising subjecting the substrate to a pulsed plasma discharge in the presence of glycidyl methacrylate at an average power density less than 0.0025 W/cm^3, wherein the pulses are applied in a single ON-OFF sequence under reaction conditions providing for growth of a continuous polymer coating on the surface, wherein the pulsed plasma discharge is applied over a period of from 30 seconds to 20 minutes, and wherein the polymer coating includes reactive surface epoxy groups.

37. (New) The method of Claim 29, wherein the plasma discharge is OFF for a period of at least 10000 μs between each pulsed discharge.

38. (New) The method of Claim 33, wherein the plasma discharge is OFF for a period of at least 10000 μs between each pulsed discharge.

39. (New) The method of Claim 36, wherein the plasma discharge is OFF for a period of at least 10000 μs between each pulsed discharge.

40. (New) The method of Claim 36, wherein about 89% of the reactive surface epoxide groups of the polymer coating have reacted after exposure of the functionalized substrate to trifluoroacetic acid vapor for 30 minutes.

41. (New) The method of Claim 36, wherein about 59% of the reactive surface epoxide groups of the polymer coating have reacted after exposure of the functionalized substrate to a solution of diethylamine in methanol for 24 hours.

42. (New) A method for immobilization of a nucleophilic reagent at a surface, comprising applying a reactive epoxy containing coating to the surface by the method of Claim 28, and contacting the surface with a solution of the nucleophilic reagent under conditions such that the nucleophilic reagent reacts with the epoxy groups.

43. (New) The method of Claim 42, wherein the nucleophilic reagent is a carboxylic acid or amine.